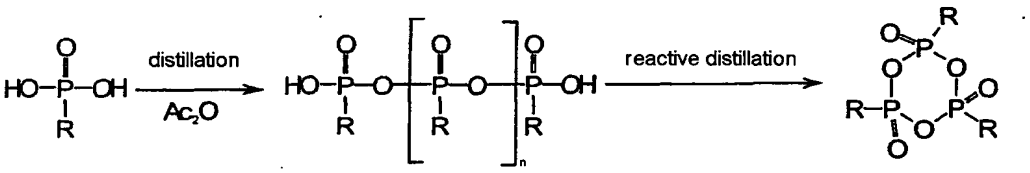
What is claimed is:

1. A process for preparing cyclic phosphonic anhydrides of the formula (III) by

a) reaction of phosphonic acid derivatives of the formula (I) with acetic anhydride at a temperature in the range from 30 to 150°C and simultaneous distillative removal of a mixture of acetic acid and acetic anhydride,

b) subsequent reactive distillation of the oligomeric phosphonic anhydrides of the formula (II) obtained in step a) and conversion to the corresponding cyclic trimeric phosphonic anhydrides of the formula (III)



I II III

where

n is an integer from 0 to 300 and

R are allyl, aryl or open-chain cyclic or branched C_1 to C_8-alkyl radicals, aryloxy, allyloxy or alkoxy having open-chain cyclic or branched C_1 to C_8-alkyl radicals.

2. The process as claimed in claim 1, wherein the cyclic trimeric phosphonic anhydrides formed in step b) are immediately dissolved in an organic solvent which is inert toward them.

3. The process as claimed in claim 1 and/or 2, wherein the ratio of acetic anhydride to phosphonic acid of the formula (I) is in the range of 20:1 and 1:1.

4. The process as claimed in at least one of claims 1 to 3 the reactive distillation in step b) is effected at a temperature in the range from 100 to 450°C (the internal reactor temperature) and a top temperature of from 100 to 380°C.

5. The process as claimed in at least one of claims 1 to 4, wherein the pressure in

a) the distillation of acetic acid and unconverted acetic anhydride is between 1 mbar and 1000 mbar, and

b) in the reactive distillation of the oligomeric phosphonic anhydrides of the formula (II) to give the cyclic phosphonic anhydrides of the formula (III) is within a pressure range between 0.001 mbar and 500 mbar.

6. The process as claimed in at least one of claims 1 to 5, which is carried out continuously.

7. The process as claimed in at least one of claims 1 to 6, wherein the resulting cyclic trimeric phosphonic anhydrides of the formula (III), after the reactive distillation, are dissolved in an organic solvent in a mixing ratio of solvent to phosphonic anhydride in the range of 10:1 and 1:10.

8. The process as claimed in at least one of claims 1 to 7, wherein the organic solvent is ligroin, sulfolane, DMSO, HMPT, NMP, pentane, hexane, heptane, octane, cyclopentane, cyclohexane, cycloheptane, cyclooctane, dichloromethane, chloroform, carbon tetrachloride, 1,2-dichloroethane, 1,1,2,2-tetrachloroethane, methyl acetate, ethyl acetate, propyl acetate, butyl acetate, dimethylformamide, diethylformamide, dimethylacetamide, diethylacetamide, diethyl ether, diisopropyl ether, tert-butyl methyl ether, THF, dioxane, acetonitrile, sulfolane, DMSO, HMPT, NMP or a mixture thereof.

9. The use of cyclic phosphonic anhydrides of the formula (III) obtainable by a process as claimed in at least one of claims 1 to 7 for condensation reactions, acylations and the preparation of heterocycles.